

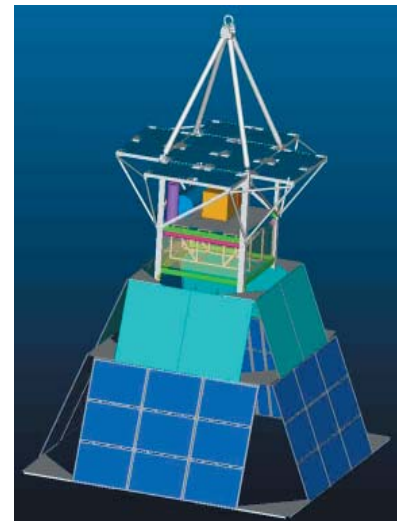


# Space Systems Department

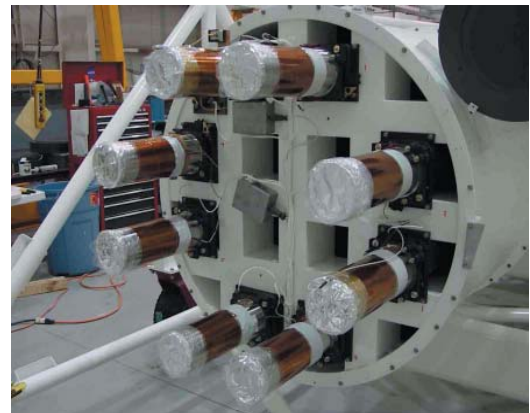
## Systems Development, Integration & Test

The Systems Development, Integration, & Test Division provides conceptual design, detailed design, development, test, integration and operations of science instrument experiments, racks, payloads, systems and subsystems. This includes requirements definition, conceptual design, detailed design, development, test, integration, launch, and mission operations.

- 0 Plans and implements ground test programs for flight certification of experiments for balloon and sounding rocket missions, International Space Station (ISS) racks, instruments, experiments, and payloads.
- 0 Supports mission operations including nominal and off-nominal flight procedure development for on-orbit operations.
- 0 Provides flight operations support and ensures the operational readiness of the Payload Rack Checkout Unit.
- 0 Develops hardware test beds supporting proof of concept, breadboard, and subsystems and systems validation.
- 0 Develops ground software test programs supporting ground testing of experiments, ISS racks, payloads, systems and subsystems.
- 0 Integrates system and component level testing for Water Recovery, Air Revitalization, Temperature and Humidity Control and Fire Detection and Suppression Systems.



Deep Space Test Bed



X-Ray Detector on HERO Telescope



Flight Robotics Laboratory

## Instrument Development

The Instrument Development Branch develops a wide range of scientific instruments and payloads to support research and advanced technology development for space research. This Branch also provides engineering support for instruments and payloads including concepts, design, fabrication, integration, test, and operations.

The Instrument Development Branch have developed high altitude balloon flight payloads, high altitude aircraft payloads, un-piloted aerial vehicle payloads, micro-satellites, ground experiments, large and small space flight experiments, advanced technology demonstrations and sounding rocket payloads. These instruments have been in the following areas: X-ray astronomy, Gamma-ray astronomy, plasma physics, ultra-violet astronomy, solar physics, ion propulsion, solar sail propulsion, earth science, micro-electromechanical system devices, advanced non-volatile computer memory, ferroelectric devices, lasers, x-ray optics, mirror technology, and advanced payload flight system architecture.

The Instrument Development Branch has electrical and mechanical laboratories used to develop instruments and payloads, including a machine shop that is capable of fabricating almost any possible mechanical component. This Branch has data systems for supporting design development as well as data acquisition and analysis. The personnel in this branch have a working relation with the joint Army/NASA micro-fabrication laboratory, which can produce MEMS devices.

## AR&D Development Team

The AR&D Development & Test Branch develops and tests the critical AR&D components and systems to enable future assistance of automated spacecraft docking maneuvers.

AR&D supports all future robust space programs including exploration and space utilization. This support requires the development and enhancement of these capabilities that can help enable such endeavors as satellite servicing, space manufacturing and maybe even commercial space tourism.

The AR&D has designed extensive development and test capabilities to allow for the preparation and evaluation of prototypes in the Flight Robotics Laboratory.

## Flight Systems Integration & Test

The Flight Systems Integration & Test Branch develops and implements hardware and software test programs to achieve certification for launch and flight operations. This includes proof of concept, development, prototype, protoflight, qualification, and acceptance testing.

The specific capabilities of the Flight Systems Integration & Test Branch include:

- 0 Flight Hardware Test Program Development
- 0 Proof of Concept Hardware Fabrication, Development and Test

### Mechanical Components Test Facility (MCTF)

- 0 Numerous Leak Test Capabilities including positive, vacuum, and pressure decay
- 0 High Pressure Test Cell up to 5000 psig
- 0 Fluid Flow Testing
- 0 Gas Flow Testing
- 0 Experiment Backfill



Flight Robotics Laboratory

### Point-of-Contact:

Timothy Ezell, Systems, Development, Integration & Test Division Chief ■ (256) 544-3620 ■ [tim.ezell@nasa.gov](mailto:tim.ezell@nasa.gov)